ON THE EMERGENCE OF GROWERS' ASSOCIATIONS: SELF-SELECTION VERSUS MARKET POWER

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On the emergence of growers' associations:

self-selection versus market power

G.W.J. Hendrikse and W.J.J. Bijman[1]

Abstract

Cooperatives in agricultural and horticultural markets have faced problems in responding to the increasing differentiation in demand as well as supply. One response is the emergence of growers' associations. They are not vertically integrated forward into a processor/retailer stage of production like cooperatives. This gives processors/retailers the freedom to invest in the direction they most like, given the increasing differentiation in demand. Growers' associations face on the supply side a trade off between self-selection and countervailing power regarding the increasing differentiation in supply. Heterogeneous growers' associations frustrate high quality growers due to the policy of uniform treatment of members, but they are strong in terms of countervailing power of the growers collectively. The opposite holds for homogeneous growers' associations.

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1 Introduction

For many decades the Dutch horticultural auction has been a very efficient organisation for the marketing of horticultural products. While the auction still is the main instrument for selling ornamentals, in fruit and vegetable it has lost its dominant position. Nowadays, most Dutch fresh produce is sold by way of contract mediation, and the auction clock is mainly used for residual supply. With this change in sales mechanism, the auction organisation has lost its central position in the marketing of fresh produce. Wholesalers who used to purchase at the auction now contract directly with growers, and growers have established new organisations to bargain with wholesalers or retailers. The marketing structure for fruit and vegetables in The Netherlands has become much more diverse, with many new organisations being set up and many new trade relationships being established. In response to shifting market conditions and the inability of the auction to accommodate these changes, growers of fruit and vegetables have set up new growers associations. These growers associations are usually organised around a specific crop.

We will analyse the emergence of grower associations from the lens of governance structure choice. The governance structure of an organisation entails the allocation of decision and income rights (Hansmann, 1996), i.e. the governance structure determines who has control over using the assets of an organisation and who receives income from using those assets. Within both a marketing cooperative and a growers' association decision rights are allocated democratically to a certain extent, that is, each member of the cooperative/association has a minimum of one vote. Some cooperatives/associations use the one-member-one-vote principle, others use a differentiated voting system. In the latter case, members have votes in proportion to their patronage of the cooperative/association. Regarding the income right, cooperatives/grower associations are governed by the equality principle, i.e. differences in the quality of produce are to a certain extent not recognized in the remuneration scheme.

The emergence of growers' associations seems to be a response of growers to the increasing differentiation in demand as well as supply in agrifood markets. Hendrikse and Veerman (2001) have addressed the increasing differentiation on the demand side of agrifood markets from the perspective of the allocation of decision rights.[2] They argue that the increasing differentiation on the demand side requires specialized assets, like the establishment of brand names, at the processing, wholesale and retail stage of the production and distribution chain. These activities will not blossom in traditional marketing cooperatives due to the focus on the interests of farmers. They predict that the governance structure marketing cooperative is less attractive in these markets and will be replaced by a governance structure which resembles market exchange. However, they do not address the design of such a governance structure. In their words 'An important topic for future research is therefore to investigate the possibilities regarding the design of a governance structure which on the one hand maintains the special character of a marketing cooperative and on the other hand eliminates the inefficiencies associated with this governance structure'.

The response to the increasing variation on the supply side in terms of quality

[2] This is in line with the incomplete contracting models of Grossman and Hart (1986) and Hart and Moore (1990) The focus on the allocation of decision rights as the distinguishing feature between governance structures corresponds with how we usually characterize the differences between investor owned firms, marketing cooperatives, labor managed firms, and so on.

seems also problematic in marketing cooperative. The uniform treatment of members in a marketing cooperative seems to play an important role in this respect. As growers want to supply more differentiated products to meet consumer demand for more variety and higher quality, it may be difficult for marketing cooperatives to accommodate this differentiation. Marketing of differentiated products may require substantially higher investments, as each product requires a unique marketing strategy. Moreover, given that the marketing cooperative sells a bundle of products to its customers, it may be very difficult to make detailed allocations of all its activities (i.e., costs) to each product and each supplier. Thus, fair remuneration of each quality supplied by the growers remains a source of conflict.

This article views a grower association as a governance structure which resembles market exchange. We distinguish homogeneous and heterogeneous grower associations. All members of a homogeneous growers' association produce the same quality of a crop, whereas differences in quality prevail between the members in a heterogeneous growers' association. Both types of growers' associations have an identical allocation of decision as well as income rights, but the diversity among farmers/growers implies that individual earnings differ between the different types of grower associations. The effect of the equality principle regarding income rights drives therefore our analysis.

The increasing differentiation on the supply side of agrifood markets is analyzed by focussing on the trade off between self-selection and countervailing power in these grower associations. The diversity among farmers/growers is responsible for this trade off. Self-selection entails that members with identical characteristics organize themselves in a homogeneous growers' association. This is attractive for farmers with high quality produce because they are now able to appropriate the benefits of their efforts / investments to a larger extent. However, a disadvantage of the emergence of (small) specialized growers' associations is that they have lower countervailing power compared to an (heterogeneous) association combining all growers. We investigate subsequently the effect of self-selection and countervailing power on the incentive to invest and determine the choice of governance structure in an incomplete contracting model.

This article is organized as follows. Section 2 describes the emergence of growers' associations. Section 3 develops a model which features the tradeoff between self-selection and countervailing power. The choice of governance structure is addressed in section 4. Section 5 concludes.

2 Growers' associations

In the early 1990s, Dutch fruit and vegetable growers became aware that the conditions in the European market for fresh produce were changing. First, consumer demand had changed. As the supply of fruit, vegetables and mushrooms is abundant and income is rising, consumers demand higher quality, more convenience and more variety. Also issues of food safety, environmental impact and other concerns about the production process play a more prominent role in purchase decisions. Second, internationalisation (or globalisation) has also affected the market for fruit and vegetables. Since the 1980s competition for Dutch fruit and vegetables in northwest-European markets has become much stronger. While the growth of consumer demand slowed down, production continued to expand in most European countries. Particularly the accession to the EU of Spain and Portugal in 1986 has given an enormous boost to the production of vegetables in Spain and its export to north-west

Europe. Third, food retail has become very concentrated in north-west Europe in recent years (ISMEA, 1999). Reasons for consolidation in food retail are the building of strong negotiating position vis-à-vis suppliers, and obtaining sufficient scale for private label products and investments in advertising and information technologies. Fourth, fruit and vegetables have become a very important product category for the major retail chains. Not only are they a good source of profit, they are also of strategic importance in building store image (Bech-Larsen, 2000).

The traditional auction had great difficulty to accommodate all these changes. Increasing dissatisfaction occurred, both on the selling and on the buying side. The auction, used to sell large numbers of products from anonymous suppliers to anonymous purchasers, was not equipped to exchange information of particular buyers to particular producers. Special demands of the large retailers, for instance in case of sales promotions, could not be met. Retailers increasingly started to look for other sources of supply. Wholesalers working for these retailers had the same complaints. They had to have buying agents at different auction at the same time to be able to buy enough produce to supply their main clients. But also on the production side, among certain growers, dissatisfaction with the auction system appeared. For instance, large growers felt that the cost allocation system of the auction – paying a percentage of sales as auction fee – was subsidizing small growers. But most dissatisfaction appeared among those growers that saw new market opportunities for higher quality and specialty products.

Innovative growers wanted to react to consumer demand for more variety and higher quality products by trying new crop varieties, often in close collaboration with a seed company. They experienced that the auction system does not support such differentiation, for at least three reasons. First, specialty products require a special marketing effort, for which the auction does not have the expertise. Most auctions did not want to start productspecific marketing activities, as it did not fit with the traditional policy of anonymous products and collective promotion. In the democratic decision making process on the policies of the auction organisation, the votes of the innovative growers were far too few to be able to force a change of strategy. Second, the auction clock may have been a very efficient sales mechanism for generic products, it provided a disincentive for product differentiation. At the auction location, all fruits and vegetables were sorted into quality classes. The lots that were brought before the auction clock represented one quality class, but often contained products from different growers. This type of bundling affects a grower's production decisions in two ways. Producing for an anonymous market gives an incentive to supply generic products, that is, products demanded by most of the buyers. There is no incentive to answer the special demands of one customer. Moreover, a grower does not have an incentive to increase product quality. As there is always some variation in a quality class, the grower will supply products with quality characteristics that are just above the lower boundary of the quality class targeted. Because targeting a higher position in the same quality class requires higher production costs but does not give him a higher price, the grower does not have an incentive to raise product quality above a level that is just above the lower minimum requirements of the quality class. Third, because being member of the cooperative auction obliges a grower to supply all its produce to the auction, there was (officially) no opportunity to find an alternative sales channel for the more innovative products. In reality, growers did try out alternative sales channels as they directly contracted a small part of their products with wholesalers, and found out they could receive a higher price than through the auction.

In reaction to changing market conditions and to dissatisfaction among both suppliers and buyers, several cooperative horticultural auctions started a reorganisation process. A major element of this process was a further concentration among cooperative auctions and a restructuring of several of these organisations into marketing firms (Bijman et al., 2000). By setting up mediation agencies within their organisation, the cooperative auctions now also facilitate direct contracting between buyers and sellers. Price discovery for this kind of sales transaction is no longer done through the auction clock, but by negotiation between auction employees (on behalf of the producers) and wholesalers or retailers. As these type of transactions often include agreements for a longer period (usually up to a year), this kind of sales mediation has the advantage that demands of individual clients can be rewarded. The producer still has the advantage of being member of a large organisation that can profit from scale economies and can protect him from contracting risks. Another reorganisation among the traditional auctions is the (further) concentration by merging into very large marketing organisations. The three largest farmer-owned marketing organisations – VTN/The Greenery, Veiling ZON and Fruitmasters – are all the result of recent mergers among regional auctions. Further restructuring is taking place among these marketing organisations, as they reduce the amount of products brought before the auction clock, and as they engaged in wholesale activities (in case of The Greenery).

Partly in response to the new market opportunities and partly in reaction to the restructuring process among the auction, new growers' associations have been set up. Even before the mergers, growers had left the auction to set up their own associations to bargain directly with wholesalers. But after The Greenery was established, even a larger number of associations were set up. Once the economies of scale, as they existed in the auction, were no longer important (the auction clock was no longer used), growers experienced they could do the bargaining with wholesalers themselves. Two types of new growers' associations have been established in reaction to changes in market conditions and changes in the cooperative auction.

The first type of new growers' association is primarily an interest organisation, representing the (common) interests of the members vis-a-vis another organisation (or government agency). Those members of Greenery, ZON or Fruitmasters producing the same crop or crop variety have established a growers' association to defend their interests within the cooperative marketing organisation. The desire to more actively express crop specific interests is the result of the larger physical and mental distance between members and cooperative marketing organisation. Particularly The Greenery is actively pursuing a strategy of service provider to major retail clients, and thus keeping its members/suppliers at a greater distance from strategic and operational decisions. In addition, the marketing efforts of The Greenery may lead to conflicts of interests between various products. Management effort is a scarce good, and (human) investments to promote one product are not necessarily equally beneficial to other products and thus to other producers. Finally, the board of directors of the cooperative is no longer deciding on operational matters (as was the case in traditional cooperative auctions), and limits its control of the management of the marketing organisation to the strategic decisions. In sum, changes in scale of operation, in functions and in decision making structure was reason for growers/members to establish new organisations to have their (product-specific) voice heard.

The second type of new growers' associations consists of growers who have left the cooperative auction. Already at the end of the 1980s innovative growers contacted seed companies and exchanged information among each other about

cultivation and marketing opportunities. As discussed above, the auction organisation was not well positioned to promote such innovation activities. Continued refusal by the auction organisation to start specific marketing programmes for these specialty products in combination with positive experiences of marketing outside of the auction lead to the decision of several of these innovative growers to establish their own producer organisation. These new growers' asssociations often took the legal form of a cooperative in order to be able to able to carry out economic activities on behalf of the members. For their sales activities these independent growers' associations often hire a sales specialist. Other activities taken up by the new cooperatives are quality inspection, sorting, packaging and marketing. They focus on the top segment of the fruit and vegetable market and have their own brand. Some contract directly with retailers, others deal with wholesalers. Examples of these new cooperative growers associations are Best Growers Benelux, Fossa Eugenia, Quality Queen Growers Group and Rainbow Growers Group. Table 1 gives a list of cooperative growers associations (including traditional auctions) that have been recognized by the Product Board for Horticulture as eligible for subsidies under the European Council 'Regulation (EC) 2200/96 on the common organisation of the market for fruit and vegetables'.

Table 1. Recognized Producer Organisations in the Netherlands (August 2000)

Name	**number of members**
Best Growers Benelux	40
Coöperatieve Champignonafzetvereniging Horst	5
Coöperatieve Telersvereniging Rijko	280
Fossa Eugenia	20
Fruitmasters Groep	1400
Nautilus	100
Quality Queen Growers Group	30
Rainbow Growers Group	60
Veiling Zaltbommel	350
Veiling Zuid-Limburg	100
Veiling Zundert	400
Veiling ZON	2400
Vers Direct Teelt	20
Voedingstuinbouw Nederland (VTN)	7250

Source: Product Board for Horticulture

3 Self selection versus market power

The distinguishing feature of a growers' association is the equality principle regarding the distribution of revenues as well as the delivery of output. The equality principle regarding the distribution of revenues entails that each member receives the same remuneration for a unit of output which is sold, regardless the quality of the product. If a grower does not produce, then no remuneration is received. The equality principle regarding the delivery of output entails that a certain quantity of demand is met by proportionally delivering from the output of each grower, regardless the quality.

Homogeneous and heterogeneous growers' associations are distinguished. All members in a homogeneous growers' association are identical, i.e. they all produce the same amount of output and quality is identical. A heterogeneous growers' association consists of at least two types of members. We assume that each member produces the same amount of output, but the quality of the output differs.

3.1 Self selection

Suppose that there are two types of growers. Grower 1 produces one unit with value A and grower 2 produces one unit with value B. Assume A > B, i.e. growers of type 1 deliver products with high value and growers of type 2 produce low value products. The value of the product of the grower will only be realised when a third party is involved, e.g. a wholesaler.

Cooperative game theory will be used to analyze the effect of the choice of grower association. A cooperative game is summarized by the characteristic function, which consists of a set of players and a specification of a payoff for every possible subset of the set of players. Three players are distinguished. Grower 1 is player 1, grower 2 is player 2, and the wholesaler is player 3. The type of growers' association determines the payoff of a coalition of players. The outcome or equilibrium of a cooperative game is a specification of a payoff for every player. The Shapley value will be used as equilibrium concept (Shapley, 1953). It is an indication of the power of each player and therefore an indication of the incentive to invest of each party.

The characteristic function of a homogeneous growers' association is N= {1,2,3}, v(Ø) = 0, v(1) = 0, v(2) = 0, v(3) = 0, v(12) = 0, v(13) = A, v(23) = B, v(123) = A + B. The Shapley value is (A/2, B/2, (A + B)/2), i.e. party 1 receives A/2, party 2 receives B/2, and party 3 receives (A+B)/2. The analysis of a heterogeneous growers' association is facilitated by defining I = {1,2}, i.e. I is the coalition of all growers. The characteristic function of a heterogeneous growers' association is N= {I,3}, v(Ø) = 0, v(I) = 0, v(3) = 0, v(I3) = A + B. The Shapley value is ((A + B)/2, (A + B)/2). Dividing (A+B)/2 equally over party 1 and 2 results in the Shapley value ((A + B)/4, (A + B)/4, (A + B)/2).

Proposition 1: Grower 1 has a stronger incentive to invest in the homogeneous growers' association than in the heterogeneous growers' association.
Proof: A/2 = (A+A)/4 > (A+B)/4 because A > B.

Proposition 2: Grower 2 has a weaker incentive to invest in the homogeneous growers' association than in the heterogeneous growers' association.
Proof: B/2 = (B+B)/2 < (A+B)/4 because A > B.

The equality principle regarding income distribution in growers' associations results in an incentive to underinvest for the high quality grower in a heterogeneous growers' association. This will result in a process of adverse selection in a heterogeneous growers' association, that is, the high quality growers will leave the heterogeneous growers' association and will establish a homogeneous growers' association consisting of only high quality growers.

Proposition 3: The power of the retailer is the same in each growers' association.
Proof: The Shapley value of the retailer is (A+B)/2 in the homogeneous as well as the heterogeneous growers' association.

3.2 Market power

Proposition 3 entails that the power of grower 1 and 2 together is the same in each growers' association. They receive together half of the total surplus. There is in the above model no change in the distribution of market power for the growers collectively when they switch from a homogeneous to a heterogeneous growers' association. The reason is that the total supply of the growers is equal to the total demand of the retailer.

The effect of the choice of grower association on the distribution of market power can be captured by reducing the demand of the wholesaler. This provides the retailer with opportunities to create competition between the growers. Suppose that the wholesaler wants to buy only one unit of the product of the growers, whereas each grower is still producing one unit. The characteristic function of the homogeneous growers' association in this market with an abundance of supply is N= {1,2,3}, v(Ø) = 0, v(1) = 0, v(2) = 0, v(3) = 0, v(12) = 0, v(13) = A, v(23) = B, v(123) = A. The Shapley value is (A/2 – B/3, B/6, A/2 + B/6). The characteristic function of the heterogeneous growers' association is N= {I,3}, v(Ø) = 0, v(I) = 0, v(3) = 0, v(I3) = (A + B)/2. (Notice that the equality principle regarding the delivery of output is responsible for v(I3)=(A+B)/2.) The Shapley value is ((A + B)/4, (A + B)/4). Decomposing this vector into the two growers results in ((A + B)/8, (A + B)/8, (A + B)/4))

Proposition 4: The homogeneous growers' association creates more value than the heterogeneous growers' association.
Proof: v(123) = A > v(I3) = (A + B)/2 because A > B.

Proposition 5: The wholesaler has more power with homogeneous growers' associations than with a heterogeneous growers' association.
Proof: The Shapley value of the wholesaler with homogeneous growers' associations is A/2 + B/6, while the total value is equal to A. The Shapley value of the wholesaler with a heterogeneous growers' association is (A + B)/4, while the total value is (A+B)/2. The retailer has more power with homogeneous growers' associations than with a heterogeneous growers' association because (A/2 + B/6)/A = 0,5 + B/6A > ((A+B)/4)/(A+B)/2 = 0,5.

The heterogeneous growers' association can be viewed as a merger of homogeneous growers' associations. It creates countervailing power towards the wholesaler, which the wholesaler does not like. The creation of homogeneous growers' associations undermines the countervailing power, i.e. the market power, of the growers collectively. This is attractive for the wholesaler. The growers obtain half of the total value with a heterogeneous growers' association, i.e. (A+B)/2, whereas they receive collectively less than half of the total value in homogeneous growers' associations, i.e. A/2-B/6.

Proposition 6: Grower 2 prefers the heterogeneous growers' association.
Proof: The Shapley value of grower 2 is (A+B)/8 in the heterogeneous growers' association. The Shapley value of grower 2 is B/6 in the homogeneous growers' association. Grower 2 prefers the heterogeneous growers' association above

homogeneous growers' association for every value of A and B because (A + B)/8 > (B + B)/8 = B/4 > B/6.

The equality principle as well as the countervailing power principle of a heterogeneous growers' association is beneficial for grower 2.

Proposition 7: Grower 1 prefers the homogeneous growers' association above the heterogeneous growers' association when 9A/11 > B.
Proof: Grower 1 prefers the homogeneous growers' association above the heterogeous growers' association when (A/2 – B/3) > (A + B)/8, i.e. 9A/11 > B.

Grower 1 prefers the heterogeneous growers' association when the difference between the two growers is not too large. The disadvantageous equality principle of the heterogeneous growers' association for grower 1 is in that situation not strong enough to eliminate the advantageous countervailing power effect. However, the tendency in agrifood markets seems to be an increase in the difference between A and B. Proposition 7 implies that the high quality growers will form a homogeneous growers' association in order to escape the equality principle of a heterogeneous growers' association. The benefits of adverse selection for the high quality growers is larger than the loss of countervailing power. The wholesaler gains in two ways from this adverse selection effect. First the size of the total pie increases from (A+B)/2 to A. Second, the wholesaler will obtain a larger share of the pie because there are now two growers' associations instead of one, which results in competition between the two homogeneous growers' associations.

4 Governance structure choice and investment

The previous section has addressed the way in which the benefits of investment will be distributed in the two growers' associations. However, it has been silent on the costs of investment. This section will address the choice of governance structure when the costs of investment are taken into account. Our analysis is in line with the standard model of governance structure choice (Grossman and Hart, 1986 and Hart and Moore, 1990). It entails a non-cooperative game in which the first stage consists of the choice of governance structure and the second stage of the investment decision.

The distribution of bargaining power in the first stage of the game is determined by the choice of governance structure. Bargaining positions are determined by the choice of investment in the second stage of the game. The previous section has determined the Shapley-value for the homogeneous as well as the heterogeneous growers' association when both parties invest. The Shapley value for the cases when only one party invests is easy to determine because only the investor and the retailer are essential. They have equal power and therefore receive half of the revenues.

Define x_i as the investment by grower i, where i=1,2. Assume that the growers take an all or nothing decision regarding their investment, i.e. $x_i = 0$ when grower i does not invest and $x_i = 1$ when the grower i invests. The vector of investment decisions is (x_1, x_2). Figure 1 summarizes the Shapley value for all cases which have to be considered. Figure 1 summarizes the relationship between the choice of governance structure, investment and the Shapley value.

		Shapley value		
Growers' association	Investment	Player 1	Player 2	Player 3
Homogeneous	(0,0)	0	0	0
Homogeneous	(1,0)	A/2	0	A/2
Homogeneous	(0,1)	0	B/2	B/2
Homogeneous	(1,1)	(3A-2B)/6	B/6	(3A+B)/6
Heterogeneous	(1,0)	A/2	0	A/2
Heterogeneous	(0,1)	0	B/2	B/2
Heterogeneous	(1,1)	(A+B)/8	(A+B)/8	(A+B)/4

Figure 1: Governance structure, investment, and Shapley value

The above implies that the choice of governance structure does not have an impact on the Shapley value when only one party invests. The remaining part of this section is dedicated to the determination of the subgame perfect equilibrium choice of governance structure when both parties invest. Assume that the costs of the investment of grower 1 are k_1 and the costs of the investment of grower 2 are k_2. It is assumed for computational reasons that grower 1 decides first and grower 2 decides second in the second stage of the game. Figure 2 presents the extensive form of the game. Notice that grower 1 decides in the first stage which governance structure will be chosen. It was determined in the previous section that grower 2 always prefers a heterogeneous growers' association above a homogeneous growers' association. The payoff of grower 1 determines therefore whether a heterogeneous or homogeneous growers' association will be chosen. Grower 1 has also the ability to implement the choice of growers' association because grower 2 can be joined in a heterogeneous growers' association or a homogeneous growers' association can be erected[3].

[3] Notice that this differs from the seminal articles of Grossman and Hart (1986) and Hart and Moore (1990) in which the choice of governance structure is driven by efficiency considerations. Strategic considerations prevail in our model.

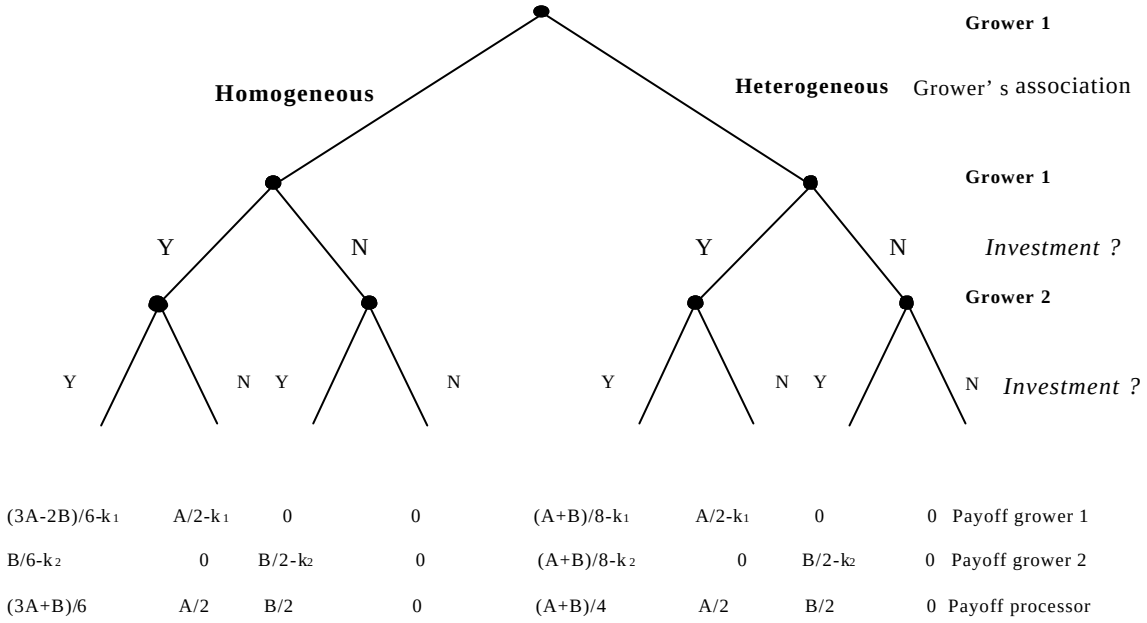

Figure 2: Extensive form of the game

Figure 3 summarizes the subgame perfect equilibrium choice of governance structure when $9A \geq 11B$. Grower 1 chooses the homogeneous growers' association ('Ho') because the benefit for grower 1 from avoiding the equality principle regarding payoffs in a heterogeneous growers' association ('He') is larger than the loss of countervailing power. If the costs of investment are above a certain level, then the grower will not invest. The choice of governance structure does not matter anymore in that situation for the other grower who is still investing. This is indicated by 'Ho/He' in figure 3.

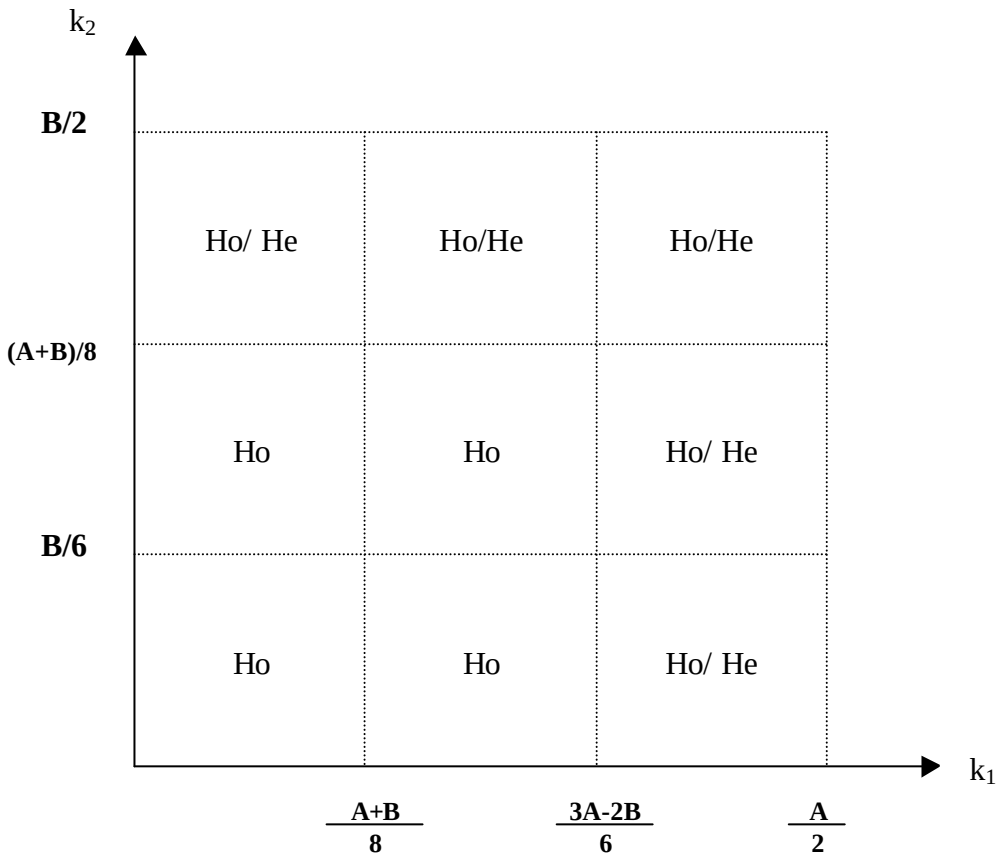

Figure 3: Subgame perfect equilibrium choice of governance structure when $9A \geq 11B$

Figure 4 summarizes the subgame perfect equilibrium choice of governance structure when $9A < 11B$. It is the reverse of figure 3. Notice that the choice of governance structure is no longer efficient. Securing countervailing power by choosing the heterogeneous growers' association goes at the expensive of efficiency. The wholesaler looses, but grower 1 (and 2) gain.

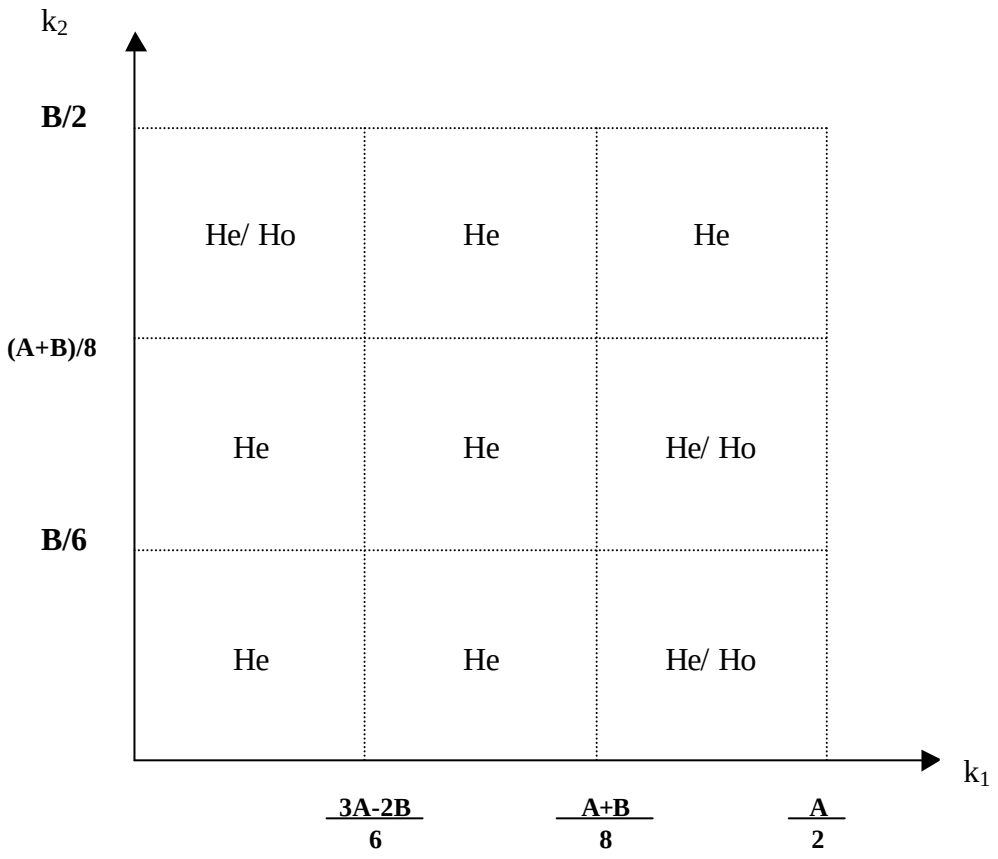

Figure 4: Subgame perfect equilibrium choice of governance structure when 9A < 11B

5 Conclusion and further research

Traditional cooperatives have faced problems in responding to the increasing differentiation in demand as well as supply. Growers' associations may be able to address these problems because they leave it to the processor/retailer in which direction they invest in response to the increasing differentiation in demand. Grower associations face a trade off between self-selection and countervailing power regarding the increasing differentiation in supply. Heterogeneous growers' associations frustrate high quality growers due to the policy of uniform treatment of members, but they are strong in terms of countervailing power of the growers collectively. The opposite holds for homogeneous growers' associations.

The above model makes a start with analyzing the emergence of growers' associations. However, only two governance structures, i.e. the homogeneous and heterogeneous growers' association, are addressed. It is therefore implicitly assumed in the above model that each player owns the assets it is using. Also, only growers are allowed to invest The incorporation of other governance structures and investment by the wholesaler can be carried out along the lines of Hendrikse and Bijman (2001). This may shed light under which circumstances the traditional cooperatives are

efficient. For example, can a traditional cooperative be efficient and viable when the difference between low and high quality members increases? Under which circumstances are grower instructions by the processor/retailer efficient? These questions will be addressed in future research.

References

Bech-Larsen, T. (2000), *The haven of the self-service store: a study of the fruit and vegetable department's influence on customer attitudes towards food chain stores*, Aarhus: The Aarhus School of Business (MAPP Working Paper No. 70).

Bijman, J., G. Hendrikse and C. Veerman (2000), 'A Marketing Co-operative as a System of Attributes: A Case Study of The VTN/The Greenery International BV', in: J.H. Trienekens and P.J.P. Zuurbier (eds.), *Chain Management in Agribusiness and Food Industry; Proceedings of the Fourth International Conference (Wageningen, 25-26 May 2000)*, Wageningen: Wageningen Pers, pp. 203-214.

Grossman, S.J. and O.D. Hart (1986), 'The Costs and Benefits of Ownership: a Theory of Vertical and Lateral Integration', *Journal of Political Economy,* 94(4), 691-719.

Hansmann, H. (1996), *The Ownership of Enterprise*, Cambridge, MA/London: The Belknap Press of Harvard University Press.

Hart, O.D. and J. Moore (1990), Property Rights and the Nature of the Firm, Journal of Political Economy, 98, 1119-1158.

Hendrikse, G.W.J. and W.J.J. Bijman (2001), 'Ownership Structure in Agrifood Chains: The Marketing Cooperative', *American Journal of Agricultural Economics*, forthcoming.

Hendrikse, G.W.J. and C.P. Veerman (2001), 'Marketing Co-operatives: an Incomplete Contracting Perspective', *Journal of Agricultural Economics*, 52 (1), 53-64.

ISMEA (1999), *The European Agro-Food System and the Challenge of Global Competition*, Rome: ISMEA.

Shapley, L. (1953), 'A Value for n-person Games', *Contributions to the Theory of Games Vol II, Annals of Mathematics Studies*,28(:307-317.

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